

Notice of Allowability

Application No.

10/531,542

Examiner

Tiffany A. Fetzner

Applicant(s)

SCHULZ ET AL.

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to 10/16/2006 & the telephonic Interview of 2/12/2007.2. The allowed claim(s) is/are Examiner amended claims 2-14.3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).a) All b) Some* c) None of the:1. Certified copies of the priority documents have been received.2. Certified copies of the priority documents have been received in Application No. _____.3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.(a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) hereto or 2) to Paper No./Mail Date _____.(b) including changes required by the attached Examiner's Amendment/Comment or in the Office action of
Paper No./Mail Date 2/012/2007.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)5. Notice of Informal Patent Application2. Notice of Draftsperson's Patent Drawing Review (PTO-948)6. Interview Summary (PTO-413),
Paper No./Mail Date 2/13/2007.3. Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____7. Examiner's Amendment/Comment4. Examiner's Comment Regarding Requirement for Deposit
of Biological Material8. Examiner's Statement of Reasons for Allowance9. Other _____.

Examiner's Amendment

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with **Attorney Thomas E. Kocovsky Jr. Reg. No. on February 12th 2007** along with authorization to charge any necessary fees to applicant's deposit account.
3. The application has been amended as follows:

A) Replace claim 3 of the October 16th 2006 amendment and response with the following Examiner amended claim 3:

Claim 3 --- A magnetic resonance imaging apparatus comprising:
an accessory device;
a connection lead of the accessory device which is configured to extend through an examination zone of a magnetic resonance imaging system during a magnetic resonance examination in which RF fields are applied in the examination zone, the connection lead including:
a multiplicity of lead segments, each lead segment including two conductive wires,
a plurality of transformers, each of the plurality of transformers including a first winding connected across the wires of one of the lead segments and a second winding connected across the wires of an adjacent lead segment, such that heating of the connection lead is avoided" ---

B) Replace claim 4 of the October 16th 2006 amendment and response with the following Examiner amended claim 4:

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Claim 4 --- A magnetic resonance imaging apparatus which is provided with at least one electrical accessory device **configured** for use during the examination of an object, as well as with a connection lead which is to be guided through an examination zone of the magnetic resonance imaging apparatus, which zone can be exposed to an RF field, and which lead is intended to connect the accessory device to a connection unit;

the connection lead having at least one lead segment that has a length which is limited by at least one inductive coupling element and is unequal to $n^*\lambda/2$, which is connected in the connection lead, where λ denotes the RF wavelength and $n = 1, 2, 3, \dots$, the inductive coupling element being a transformer, the transformer being formed by a toroid as well as a primary and secondary winding wound thereon. ---

C) Replace claim 5 of the October 16th 2006 amendment and response with the following **Examiner amended claim 5**:

Claim 5 --- A magnetic resonance imaging apparatus comprising:

 a magnetic resonance accessory including at least one RF coil;

 a connection lead connected with the accessory and **configured** to extend through an examination zone during a magnetic resonance imaging process, the connection lead including:

 a plurality of conductive, lead segment loops arranged end to end;

 each **conductive** lead segment loop having a length unequal to $n^*\lambda/2$, where λ denotes RF wavelength of RF signals applied in the examination zone during the imaging process and n is an integer; **and**

 a plurality of inductive coupling conductor loops, each inductive coupling conductor loop being arranged adjacent a pair of **neighboring** lead segment loops and **over end zones of the neighboring lead segments in order to inductively couple the pair of lead segment loops to one another.**---

D) Replace claim 8 of the October 16th 2006 amendment and response with the following Examiner amended claim 8:

Claim 8 --- A magnetic resonance imaging apparatus as claimed in **claim 3**, in which at least one capacitive element is connected with each transformer so as to form a resonant circuit with the resonance condition of said resonant circuit being satisfied for the frequency of a signal to be transferred via the connection lead. ---

E) Replace claim 10 of the October 16th 2006 amendment and response with the following Examiner amended claim 10:

Claim 10 --- A magnetic resonance imaging apparatus as claimed in **claim 3**, wherein the accessory device includes a body coil **configured** for use during the magnetic resonance examination of an object, the connection lead being arranged so as to extend through the examination zone and be exposed to an the RF fields at least one of the lead segments having a length which is unequal to $n^*\lambda/2$, , where λ denotes the RF wavelength and $n = 1, 2, 3, \dots$. ---

F) Replace claim 11 of the October 16th 2006 amendment and response with the following Examiner amended claim 11:

Claim 11 --- A magnetic resonance imaging apparatus as claimed in **claim 3** wherein the accessory includes a catheter with a transmission and/or receiving unit **configured** for use during the examination procedure of an object in the examination zone, the connection lead being arranged so as to extend through the examination zone in order to connect the transmission and/or receiving unit to a connection unit, at least

one of the lead segments, having a length which is unequal to $n*\lambda/2$, , where λ denotes the wavelength of the applied RF fields and $n = 1, 2, 3,$

The following is an examiner's statement of Reasons for Allowance:

4. With respect to **independent claim 3, dependent claims 2, 6, 7, and examiner amended dependent claims 8, 10, and 11**: These claims are considered to be allowable over the prior art of record because the prior art of record neither discloses nor suggests the combination of an MRI apparatus comprising: an accessory device; a connection lead of the accessory device which is configured to extend through an examination zone of a magnetic resonance imaging system during a magnetic resonance examination in which RF fields are applied in the examination zone, the connection lead including: a multiplicity of lead segments, each lead segment including two conductive wires, a plurality of transformers, each of the plurality of transformers including a first winding connected across the wires of one of the lead segments and a second winding connected across the wires of an adjacent lead segment, such that heating of the connection lead is avoided" It is the entire combination of the claim limitations taken as a whole that constitutes both the novelty and non-obviousness of applicant's claims, since it is the specific type of connection lead, set forth which constitutes the novelty of **Examiner amended independent claim 3**.

5. With respect to **independent claim 4, dependent claims 9, and 13**: these claims are considered to be allowable over the prior art of record because the prior art of record neither discloses nor suggests the combination of a magnetic resonance imaging apparatus which is provided with at least one electrical accessory device configured for use during the examination of an object, as well as with a connection lead which is to be guided through an examination zone of the magnetic resonance imaging apparatus, which zone can be exposed to an RF field, and which lead is intended to connect the accessory device to a connection unit; the connection lead having at least one lead segment that has a length which is limited by at least one inductive coupling element and is unequal to $n*\lambda/2$, which is connected in the connection lead, where λ

denotes the RF wavelength and n = 1, 2, 3, ..., the inductive coupling element being a transformer, the transformer being formed by a toroid as well as a primary and secondary winding wound thereon. It is the entire combination of the claim limitations in this configuration, taken as a whole that constitutes both the novelty and non-obviousness of applicant's claims.

6. With respect to independent claim 5, dependent claims 12, and 14: these claims are considered to be allowable over the prior art of record because the prior art of record neither discloses nor suggests the combination of a magnetic resonance imaging apparatus comprising: a magnetic resonance accessory including at least one RF coil; a connection lead connected with the accessory and configured to extend through an examination zone during a magnetic resonance imaging process, the connection lead including: a plurality of conductive, lead segment loops arranged end to end; each conductive lead segment loop having a length unequal to $n^*\lambda/2$, where λ denotes RF wavelength of RF signals applied in the examination zone during the imaging process and n is an integer; and a plurality of inductive coupling conductor loops, each inductive coupling conductor loop being arranged adjacent a pair of neighboring lead segment loops and over end zones of the neighboring lead segments in order to inductively couple the pair of lead segment loops to one another. It is the entire combination of the recited claim limitations taken as a whole that constitutes both the novelty and non-obviousness of applicant's claims.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Examiner's Comment

Priority

8. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

9. The information disclosure statement (IDS) submitted on 04/15/2005 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement. The initialed and dated information disclosure statement was previously attached to the office action of July 21st 2006.

Drawings

10. The drawing corrections submitted **October 16th 2006** to **figure 6** are approved by the examiner.

11. The following changes to the drawings have been approved by the examiner and agreed upon by applicant:

A) **Figures 3, 4, 5, and 8 will be corrected to include the proper schematic symbol for a transformer that is conventional with US practice**, in order to ensure that applicant's figures will properly depict the novelty set forth in applicant's claims, without any ambiguity being caused by use of a non-standard 'transformer' schematic symbol, that may be confused with any, inductive, capacitive, or resistive component, which may not be a transformer. In order to avoid abandonment of the application, applicant must make these above agreed upon drawing changes.

12. **The proposed changes, which have been agreed upon, must be submitted as a new set of formal drawings in response to this office action.** Drawings showing the informal proposed drawing changes are attached to this office action.

Specification

13. The amendments to the specification from the **October 16th 2006** amendment and response are approved by the examiner.

Prior Art of Record

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) **Vrijheid US patent 6,496,006 B1** issued December 17th 2002, filed June 8th 2000.

B) **Vrijheid International Publication WO 00/77926** published December 21st 2000.

- C) Gilderdale US patent 6,543,189 B1 issued September 17th 2002, filed November 15th 2000
- D) Vrijheid et al., International publication WO 02/42790 A1 published May 30th 2002.
- E) Vrijheid et al., US patent application publication 2002/0095084 A1 published July 18th 2002, filed November 21st 2001.
- F) Duerr US patent 5,294,886 issued March 15th 1994.
- G) Schultz et al., US patent application publication 2005/0218897 A1 published October 6th 2005. The examiner notes that this reference corresponds to applicant's original disclosed description only. The claims provided in this publication, are not the applicant's originally disclosed claims, they are claims to a different application. The applicant's originally disclosed claims, were not published, with the proper specification.

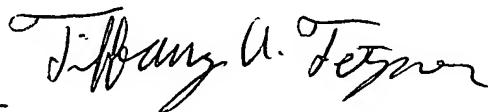
Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(571) 273-8300**.

17. Information regarding the status of an application may be obtained from the Patent Application information Retrieval (PAIR) system Status information for published applications may be obtained from either Private PMR or Public PMR. Status information for unpublished applications is available through Private PMR only. For more information about the PMR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PMR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TAF
Date February 13, 2007



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800

Feb. 13th 2007

Proposed Corrections for Figures 3 Through 5 Sheet 2 of 3

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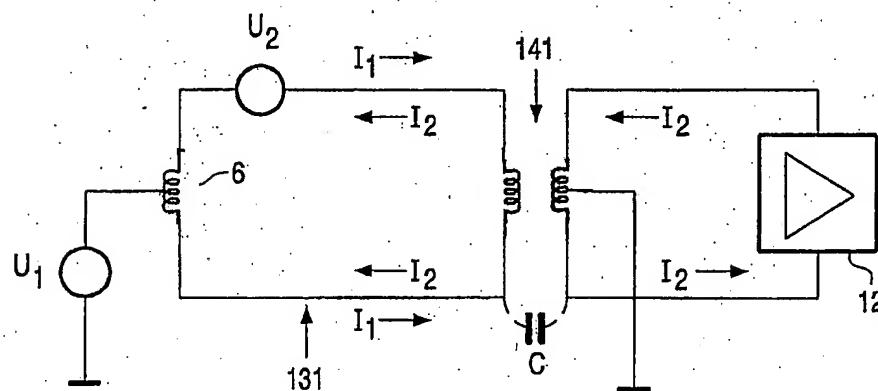


FIG. 3

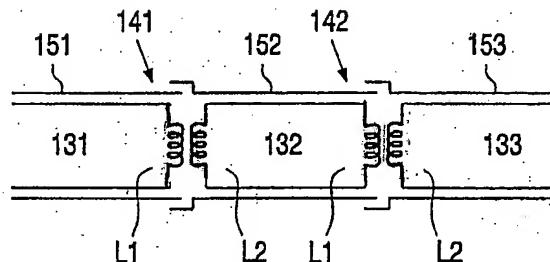


FIG. 4

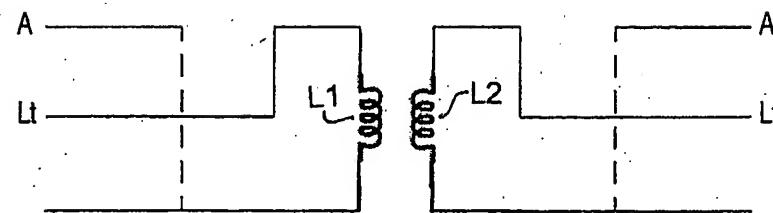


FIG. 5

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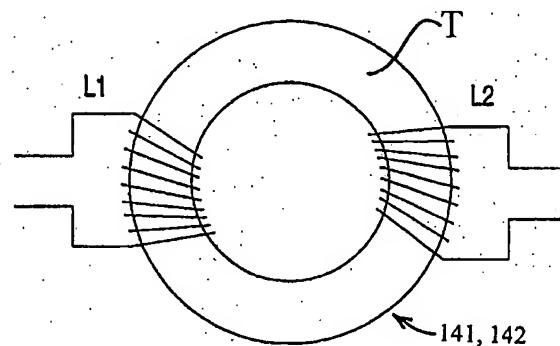


FIG. 6

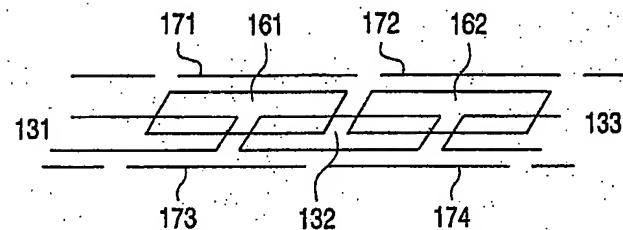


FIG. 7

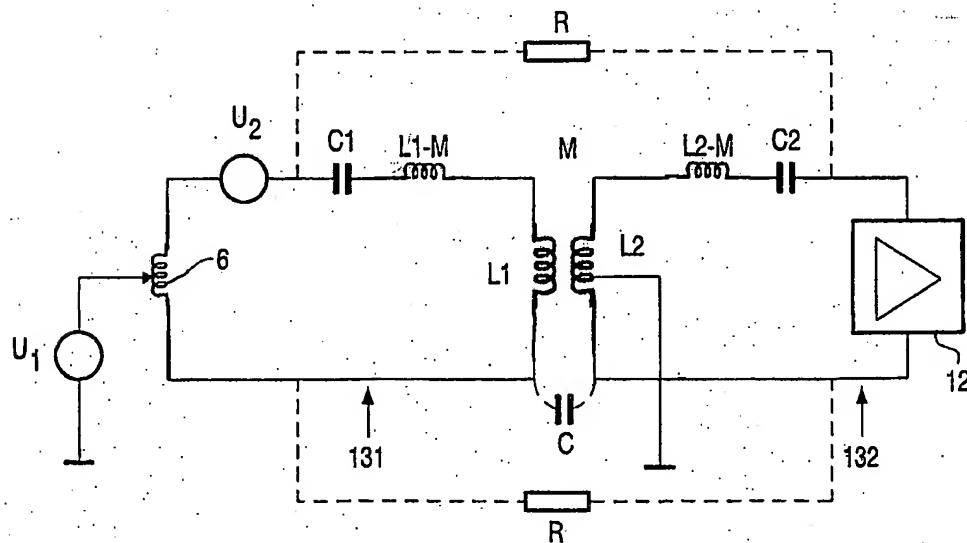


FIG. 8